



## Taxonomy of the *Tabanus immanis* Species Group (Diptera: Tabanidae) in Korea

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**Abstract** Horseflies of the *Tabanus immanis* species group from Korea are revised taxonomically. A total of six species are arranged herein. Among them, *T. vibex* is new to science, and *T. toshiokai* is newly recorded. A key, annotated domestic records, and collection data are also provided.

**Key words** *Tabanus vibex*, new species

### INTRODUCTION

The horseflies are one of the largest group of blood-sucking insects that attack domestic and large wild animals. They considerably affect the health and hygiene of livestock because of their capacity for holding large quantities of blood, ability to transmit certain disease causing organisms, irritation, and secondary infections by the feeding punctures.

Over 200 species of the genus *Tabanus* are currently known globally, whereas 25 *Tabanus* species have been known to Korea, hitherto. In this study, we examined six Korean species of the *Tabanus immanis* species group (sensu Wang, 1994), including a new species and a newly recorded species in Korea.

The *T. immanis* species group can be characterized as follows: wing cell R5 not closed; flagellum without anteriorly projected dorsal process; abdominal tergum with triangular spot; basal and median calli combined.

Depositories for the boucher specimens are as follows: Systematic Entomology Laboratory, Department of Agricultural Biology, Kyungpook National University, Daegu, Korea (KPNU); Division of Entomology, National Science Museum, Daejeon, Korea (ENSM).

Provincial names for the collection localities are abbreviated as follows: Gyeonggi-do (GG); Gangweon-do (GW); Chungcheongbuk-do (CB); Chungcheongnam-do (CN); Jeollabuk-do (JB); Jeollanam-do (JN); Gyeongsangbuk-do (GB); Gyeongsangnam-do (GN); Jeju-do (JJ).

### SYSTEMATICS

#### Key to Korean species

1. Flagellum with prominent, forwardly projected dorsal process ..... *pleskei*  
– Flagellum without forwardly projected dorsal process ..... 2
2. Basal callus clearly separated from subcallus ..... 3  
– Basal callus connected or almost connected to subcallus ..... 4

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3. Abdomen dorsally with single longitudinal row of interrupted triangular markings ..... *vibex* sp. nov.  
 – Abdomen dorsally with three longitudinal rows of interrupted triangular markings ..... *toshiokai*
4. Scutellum black ..... *chosenensis*  
 – Scutellum white ..... 5
5. Wing vein R<sub>4</sub> with appendix ..... *galloisi*  
 – Wing vein R<sub>4</sub> without appendix ..... *miyajima*

***Tabanus chosenensis* Murdoch et Takahasi, 1969 우리등에**

*Tabanus chosenensis* Murdoch et Takahashi, 1969: 72; Kim *et al.*, 1973: 60; Hyun et Shin, 1975: 17–21; Moucha, 1976: 98; Soos et Papp, 1988: 141; Kwon *et al.*, 1994: 283; Kwon *et al.*, 1996: 214.

**Material examined.** [ENSM] JB: 1 ex., Gimje, 22 VII 1973 (SM Lee); 1 ex., Gyodae-ri, 7 VIII 1973 (SM Lee); [KPNU] CN: 1 ex., Yuseong, 18 VI 1999 (YJ Kwon); 1 ex., same locality, 7 VII 1999 (YJ Kwon); 1 ex., same locality, 13 VII 1999 (YJ Kwon); 4 exs., same locality, 14 VII 1999 (YJ Kwon); 2 exs., same locality, 18 VII 1999 (YJ Kwon); 3 exs., same locality, 20 VII 1999 (YJ Kwon); 1 ex., same locality, 21 VII 1999 (YJ Kwon); 1 ex., same locality, 16 VII 2000 (YJ Kwon); 1 ex., same locality, 18 VII 2000 (YJ Kwon); 1 ex., same locality, 21 VII 2000 (YJ Kwon); GB: 1 ex., Daegu city, 10 VIII 1979 (YJ Kwon); 1 ex., same locality, 25 VIII 1980 (YJ Kwon); 1 ex., same locality, 7 VII 1980 (YJ Kwon); 1 ex., same locality, 2 VII 1984 (YJ Kwon); 1 ex., same locality, 1 VIII 2001 (YJ Kwon); 1 ex., Dansan-myeon, 17 VIII 1982 (YJ Kwon); 1 ex., Palgongsan, 6 VI 1978 (YJ Kwon); 1 ex., Hwangaksan, 10 VI 1980 (YJ Kwon); JB: 2 exs., Ongdong, 9 VII 1973 (SM Lee).

**Locality.** CN: Yuseong; GB: Daegu, Dansan-myeon, Hwangaksan; Palgongsan; GG: Panmunjeom, Seoul; JB: Jeongeup, Ongdong.

**Distribution.** Korea (Central, South).

***Tabanus galloisi* Kono et Takahasi, 1939 갈로이스등에**

*Tabanus galloisi* Kono et Takahashi, 1939: 14–15; Murdoch et Takahashi, 1969: 69; Kim *et al.*, 1973: 60; Hyun et Shin, 1975: 17–21; Moucha, 1976: 110; Kim et Nam, 1982: 170; Soos et Papp, 1988: 143; Kim et Lee, 1991: 83; Park *et al.*, 1993: 207; Kwon *et al.*, 1994: 283; Kim *et al.*, 1994: 116; Kim, 1995: 144; Kwon *et al.*, 1996: 214.

*Tabanus galloisi* (sic): Kim et Kim, 1974: 104.

**Material examined.** [KPNU] CN: 1 ex., Deoksungsan, 27 V 1982 (YJ Kwon); 2 exs., Yuseong, 26 VI 1999 (YJ Kwon); 1 ex., same locality, 30 VI 1999 (YJ Kwon); 1 ex., same locality, 5 VII 1999 (YJ Kwon); 1 ex., same locality, 14 VII 1999 (YJ Kwon); 1 ex., same locality, 18 VII 1999 (YJ Kwon); 1 ex., same locality, 21 VII 1999 (YJ Kwon); 1 ex., same locality, 26 VII 2000 (YJ Kwon); GB: 1 ex., Juwangsan, 26 VII 1984 (YJ Kwon); 1 ex., Sangni-myeon, 7–14 VI 2001 (YJ Kwon); 2 exs., same locality, 4–21 VI 2001 (YJ Kwon); 1 ex., same locality, 21–28 VI 2001 (YJ Kwon); 8 exs., same locality, 28 VI–5 VII 2001 (YJ Kwon); 6 exs., same locality, 19–26 VII 2001 (YJ Kwon); 13 exs., same locality, 26 VII–2 VIII 2001 (YJ Kwon); 10 exs., same locality, 2–9 VIII 2001 (YJ Kwon); 1 ex., same locality, 3 VIII 2001 (YJ Kwon); 1 ex., same locality, 9–16 VIII 2001 (YJ Kwon); 1 ex., same locality, 30 VIII–6 IX 2001 (YJ Kwon); JB: 2 exs., Jinan, 9 VII 1973 (SM Lee); 1 ex., Ongdong, 23 VII 1973 (SM Lee); 2 exs., Seonunsa, 12 VII 1984 (SM Lee); [ENSM] CN: 1 ex., Seongon-ni, 25 VII 1996 (SL An); GG: 1 ex., Gwangneung, 30 VII 1973 (SM Lee); JB: 1 ex., Byeonsan, 27 VI 1973 (SM Lee); 1 ex., Donghyang, 23 VI 1973 (SM Lee); 1 ex., same

locality, 24 VI 1973 (SM Lee); 1 ex., Jinan, 23 V 1973 (SM Lee); 1 ex., same locality, 23 VI 1973 (SM Lee); 2 exs., Muju, 27 VII 1973 (SM Lee); 2 exs., Ongdong, 9 VII 1973 (SM Lee); 1 ex., same locality, 23 VII 1973 (SM Lee); JJ: 1 ex., Gyodae-ri, 6 VIII 1973 (SM Lee).

**Locality.** CN: Deoksungsan, Seongon-ni, Yuseong; GB: Juwangsan, Sangni-myeon; GG: Cheonmasan, Deokjeokdo, Dobongsan, Gwangdeoksan, Gwangneung, Suwon, Seoul; GN: Jirisan; JB: Baegyongsan, Buan, Byeonsan, Donghyang, Gochang, Jeongeup, Jinan, Muju, Ongdong; JJ: Gyodae-ri, Jejudo.

**Distribution.** Korea (Central, South, Jejudo).

***Tabanus miyajima* Ricardo, 1911 미야지마등에**

*Tabanus miyajima* Ricardo, 1911: 250; Chow, 1973: 50; Kim et Nam, 1982: 170; Kwon *et al.*, 1994: 283; Kwon *et al.*, 1996: 214.

*Tabanus albotibialis* Matsumura, 1916: 382.

**Material examined.** Unavailable.

**Locality.** GG: Seoul.

**Distribution.** Korea (Central), Japan (Honshu, Shikoku, Kyushu).

**Remarks.** The occurrence of this species was first confirmed by Chow (1973) through the courtesy of Takahasi's personal communication without giving the collection locality in Korea. The authors have no chance to examine the boucher material, although Kim and Nam (1982) reported this species to be collected in Seoul.

***Tabanus pleskei* Kröber, 1925 동쪽등에**

*Tabanus pleskei* Kröber, 1925: 124; Murdoch et Takahasi, 1969: 61; Wang, 1983: 98; Soos et Papp, 1988: 151; Kwon *et al.*, 1994: 283; Kwon *et al.*, 1996: 214.

**Material examined.** [KPNU] GG: 1 ex., Gwangneung, 2 VII 1972 (SM Lee).

**Locality.** GG: Gwangneung.

**Distribution.** Korea (Central), China (Beijing, Heilongjiang, Jilin, Liaoning, Shaanxi), Russia (Amur, Siberia, Ussuri), Mongolia.

***Tabanus toshiokai* Murdoch et Takahasi, 1969 에기줄등에 (신칭)**

(Fig. 1)

*Tabanus toshiokai* Murdoch et Takahasi, 1969: 78.

**Diagnosis.** Female: Length 11–12 mm. Eye nude without stripe. Frons yellowish gray, about 4–5 times as high as basal width, very slightly widened above; basal callus shiny black, rectangular or circular, narrowly separated from eye; median callus shiny black, flame-like, connected to basal callus by narrow line; subcallus black, covered with grayish yellow pollen; antennal fossa rather brighter. Antenna dark brown, scape and pedicel with black hair; dorsal process moderate. Clypeus and gena whitish gray, covered with concolorous hairs. Second palpal segment whitish yellow, covered with a mixture of creamy white and black hairs, strongly swollen at base.

Thorax grayish black with indistinct gray stripes, covered with short yellow and rather longer black hairs; humeral callus gray; pleura, sternum and coxae ash-gray, covered with whitish gray hairs; mesopleuron with some black hairs intermixed. Femora black, covered with gray pollen and light hairs; fore femur with some black hairs intermixed; apices of femora and tibiae yellowish brown; the apical third of fore tibia black and apices of others darkened; tarsi black. Wing hyaline, veins pale brown; Cell R<sub>5</sub> open; halter yellowish brown, with dark knob.

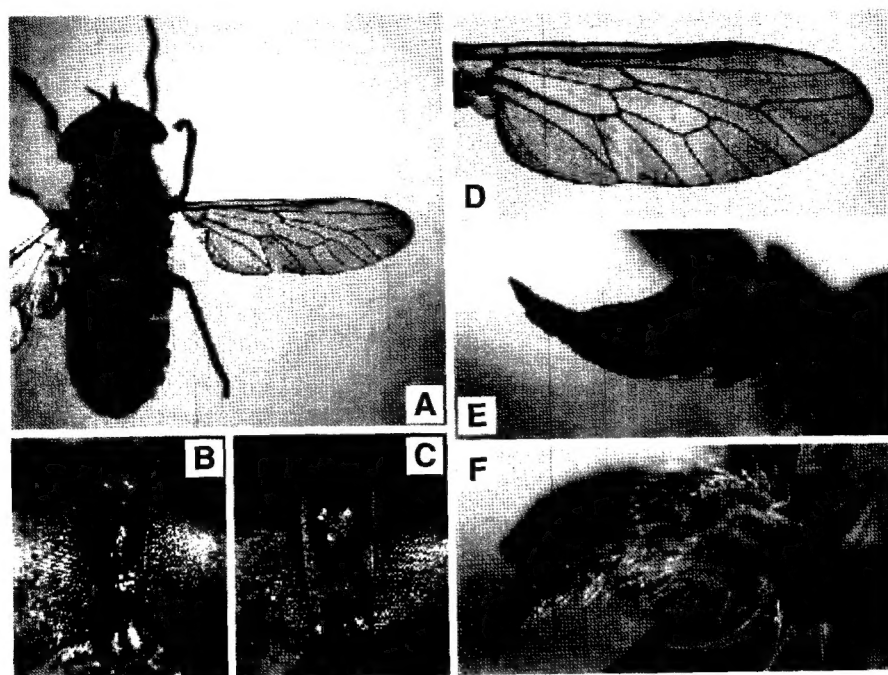


Fig. 1. *Tabanus toshiokai*, female. A: dorsal feature, B-C: head, D: wing, E: antenna, F: palpus.

Abdomen wholly black with 3 rows of yellowish gray triangular spots, posterior margin of each tergum with very narrow whitish yellow border; venter of abdomen grayish black with a black mid ventral stripe, posterior border of each tergum with very narrow whitish yellow stripe; 7th sternum with numerous long curved black hairs.

*Material examined.* [KPNU] GB: 2 exs., Sangni-myeon, 31 V-7 VI 2001 (YJ Kwon).

*Distribution.* Korea (new record: South), Japan (Shikoku, Kyushu, Ryukyus).

*Tabanus vibex* sp. nov. 줄등에 (신칭)  
(Fig. 2)

*Description.* Female: Length 14 mm. Eye bare without stripe. Frons brownish gray, about 4 times as high as wide at its base, slightly widened above; the vertex gray, with black hair; basal callus shiny black, subcircular or shield-shaped; narrowly separated from eye and rather broadly so from subcallus; median callus shiny-black, spindle-shaped, narrowly joined to basal callus; subcallus dark brown to black, covered with thin yellow-gray pollen. Antenna wholly orange-yellow, scape and pedicel with black hairs; basal portion of flagellum short, about 1 and 1/2 times as long as width, dorsal process indistinct. Clypeus and genae ash-gray, covered with whitish gray hairs. Second palpal segment creamy white, with a mixture of black and white hairs, curved at base then gradually tapering to apex.

Thorax covered with a mixture of some short yellow and a few black hairs, with 3 gray stripes; prealar callus dark; pleura, sternum, and fore coxa slate-gray, with tuft of long hairs; femora slate-gray, tibiae pale brown, its apical fourth brownish black; tarsi brownish black. Wing hyaline, vein dark brown, vein R<sub>4</sub> without appendix. Halter dark brown.

Abdomen velvety-black with a distinct row of yellow median triangular spots; hind margin-

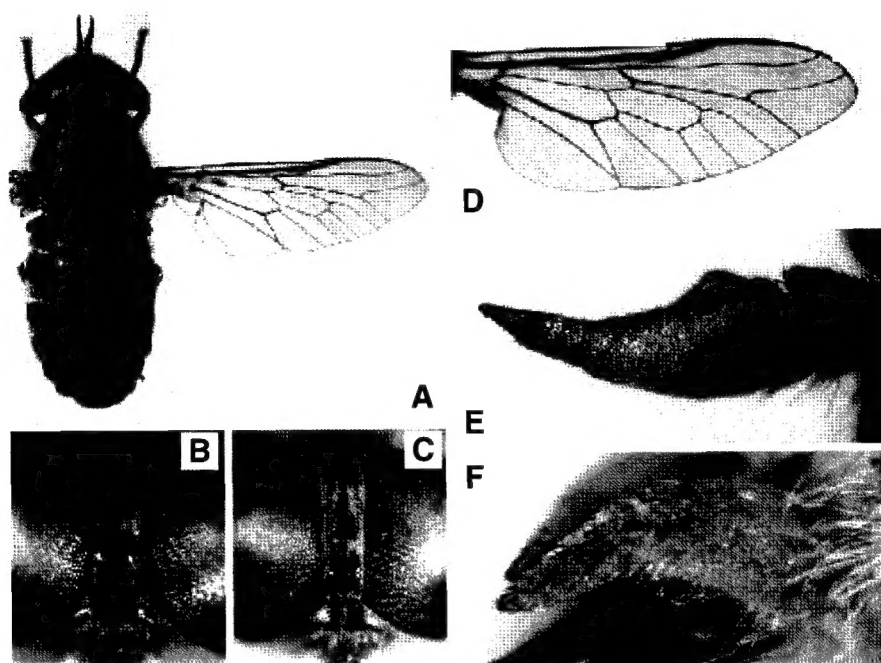


Fig. 2. *Tabanus vibex* sp. nov., female. A: dorsal feature, B–C: head, D: wing, E: antenna, F: palpus.

nal band yellow and hairy, rather broad but disappearing at both sides of median triangular spots so that the bands make a triangular lateral spot. The lateral extreme end of second tergum brownish at base. Venter wholly blackish gray with yellow hairs.

*Types.* Holotype: ♀, [KPNU] GB: Tonggosan, GB, Korea, 12 V 2001 (YJ Kwon).

*Paratypes:* [KPNU] GB: 2 ♀, Palgongsan, 9 V 2001 (YJ Kwon); 10 ♀, Tonggosan, 12 V 2001 (YJ Kwon).

*Distribution.* Korea (South).

*Etymology.* The specific name is derived from the Latin, 'vibex' (= stripe), corresponding to a distinct abdominal yellow median stripe.

*Remarks.* This new species is allied to *Tabanus geminus* Szilady in external feature, but can be readily separated from it by the larger median callus and size.

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